



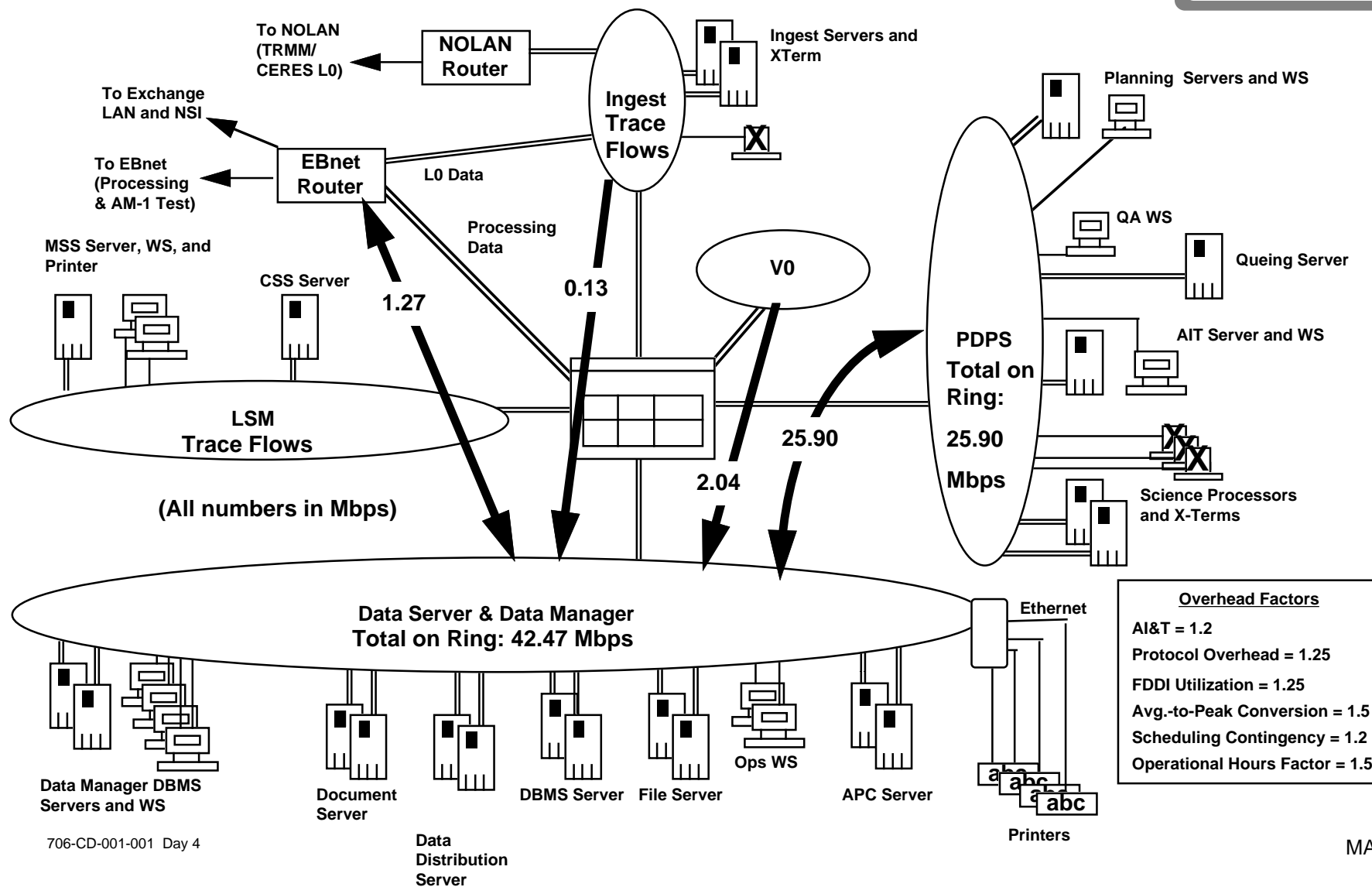
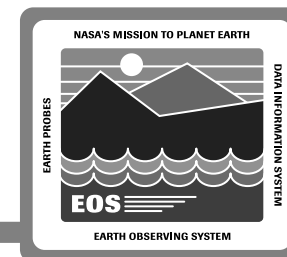
DAAC/SMC Network Architecture

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**ECS Release A SDPS/CSMS Critical Design Review
17 August 1995**

Release A DAAC LANs: Generic Topology (LaRC)



DAAC LAN Network Architecture



Central high-performance FDDI switch/router connecting multiple FDDI rings

DAAC Subsystems supported by FDDI rings

- Ingest, LSM, and PDPS have individual rings
- Data Server and CIDM share single ring
- Ingest and PDPS rings segregated from all user traffic

All hosts (servers, processors, and workstations) connected to FDDI

- Printers connected to Ethernet

EBnet External Interface provides connectivity to

- EBnet for DAAC-DAAC and L0 ingest
- NSI and campus exchange LANs for user access
- EBnet ingest interface connects directly to Ingest ring (bypassing switch)

DAAC LAN Hardware



FDDI Switch/Router

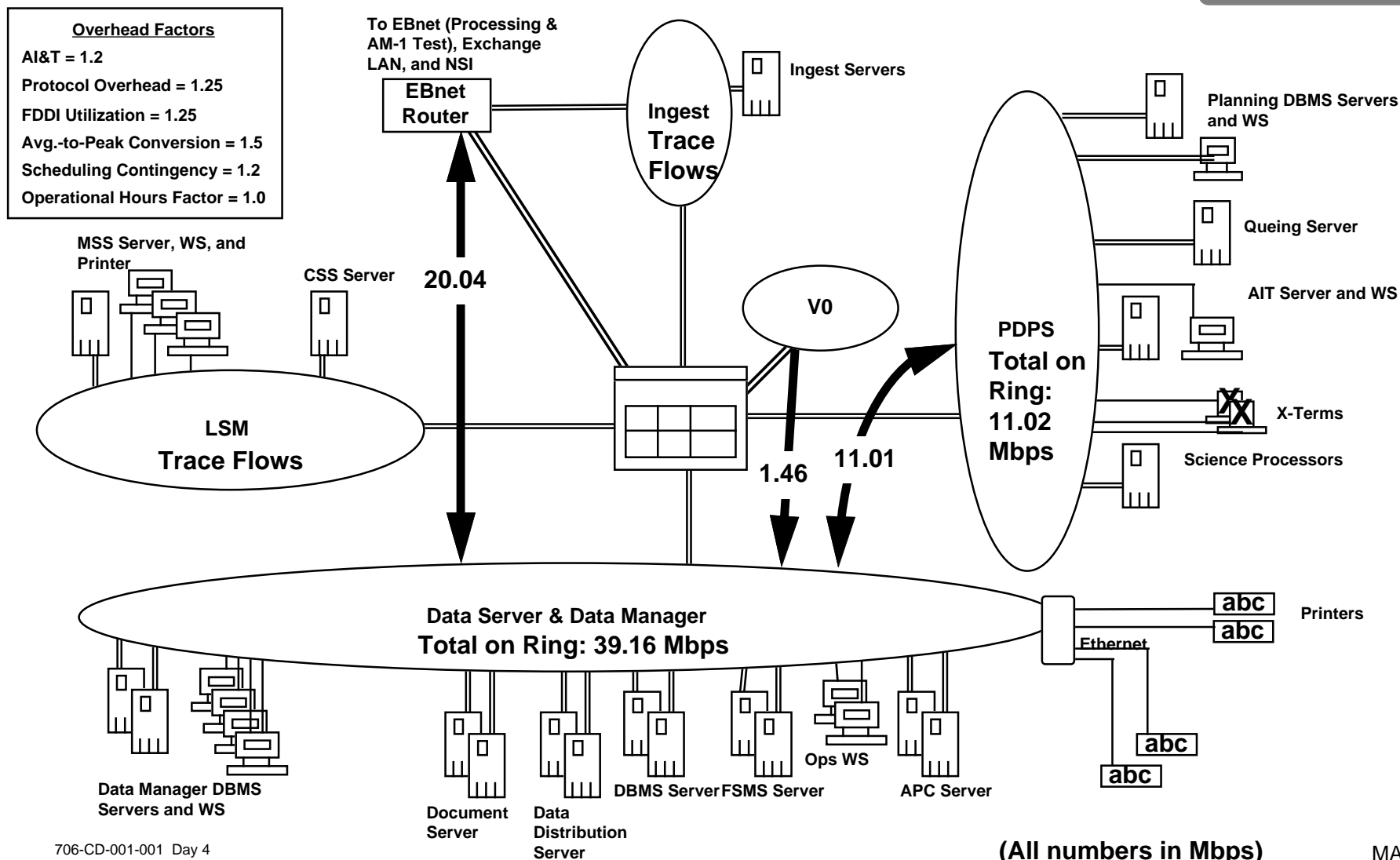
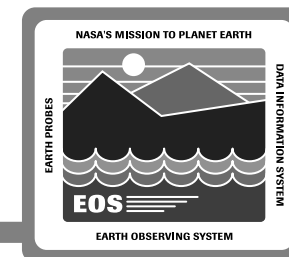
- **Very high-performance, capable of handling all interfaces at full speed without degradation**
- **Both switching and routing on each port; each port gets full FDDI bandwidth (non-blocking)**
- **High redundancy and availability**
- **Highly scalable (up to at least 16 FDDI rings within single chassis; additional ports added via extra interface cards)**
- **Provides filtering at IP and TCP layer to control external access**

FDDI rings implemented via Bay Networks System 2000 FDDI concentrators

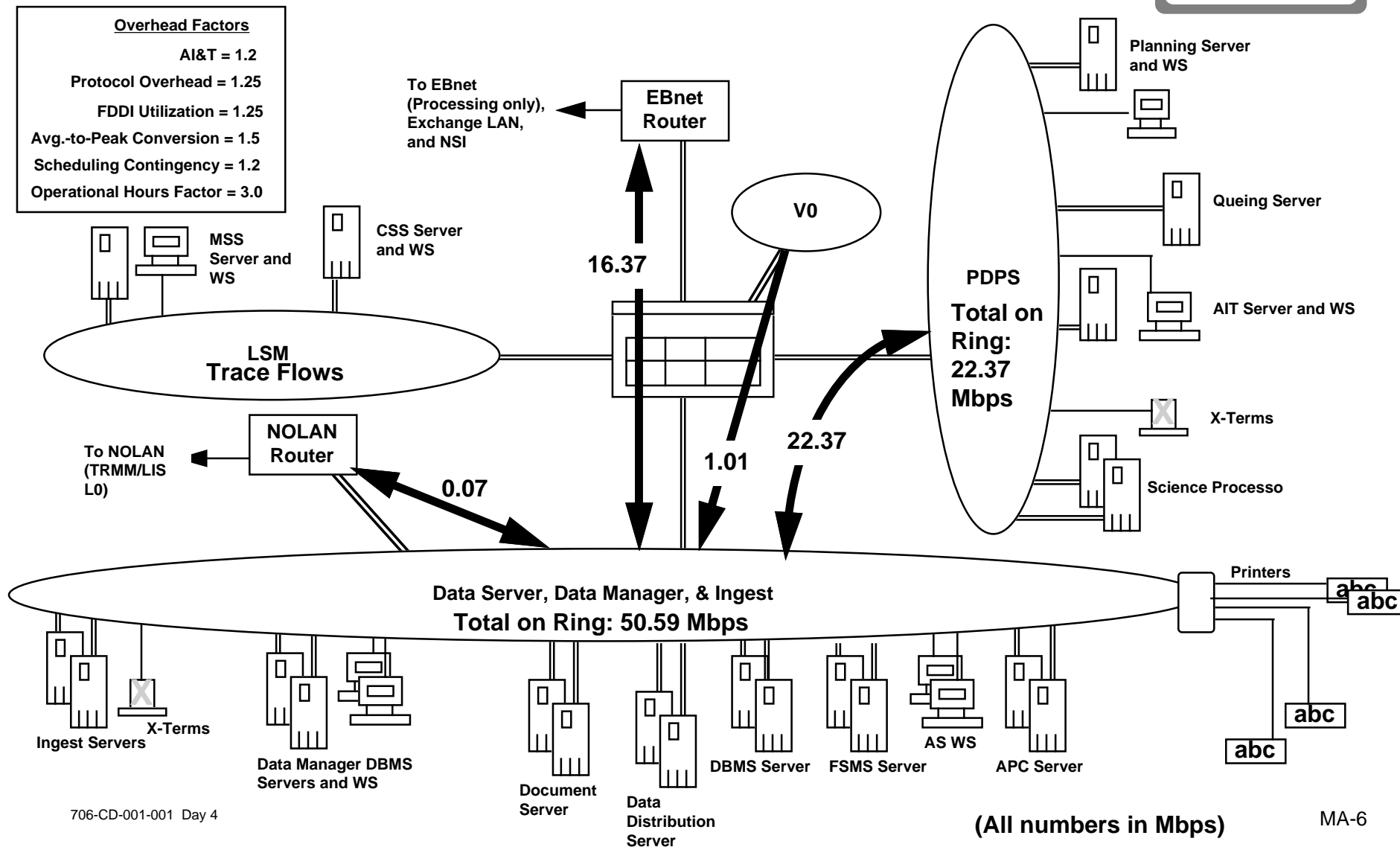
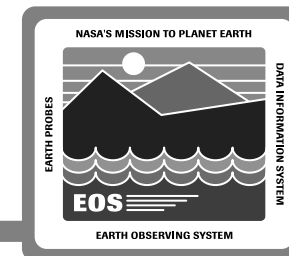
- **Servers and processors dual-homed to separate concentrators (provides complete redundancy)**
- **Workstations single-attached to one concentrator**

Ethernet for printers connects to FDDI through Cabletron MicroMAC hub

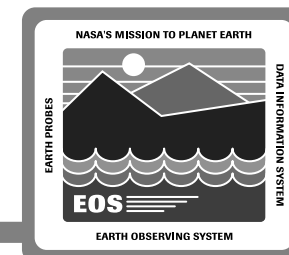
GSFC Release A DAAC LAN



MSFC Release A DAAC LAN



EDC Release A DAAC LAN

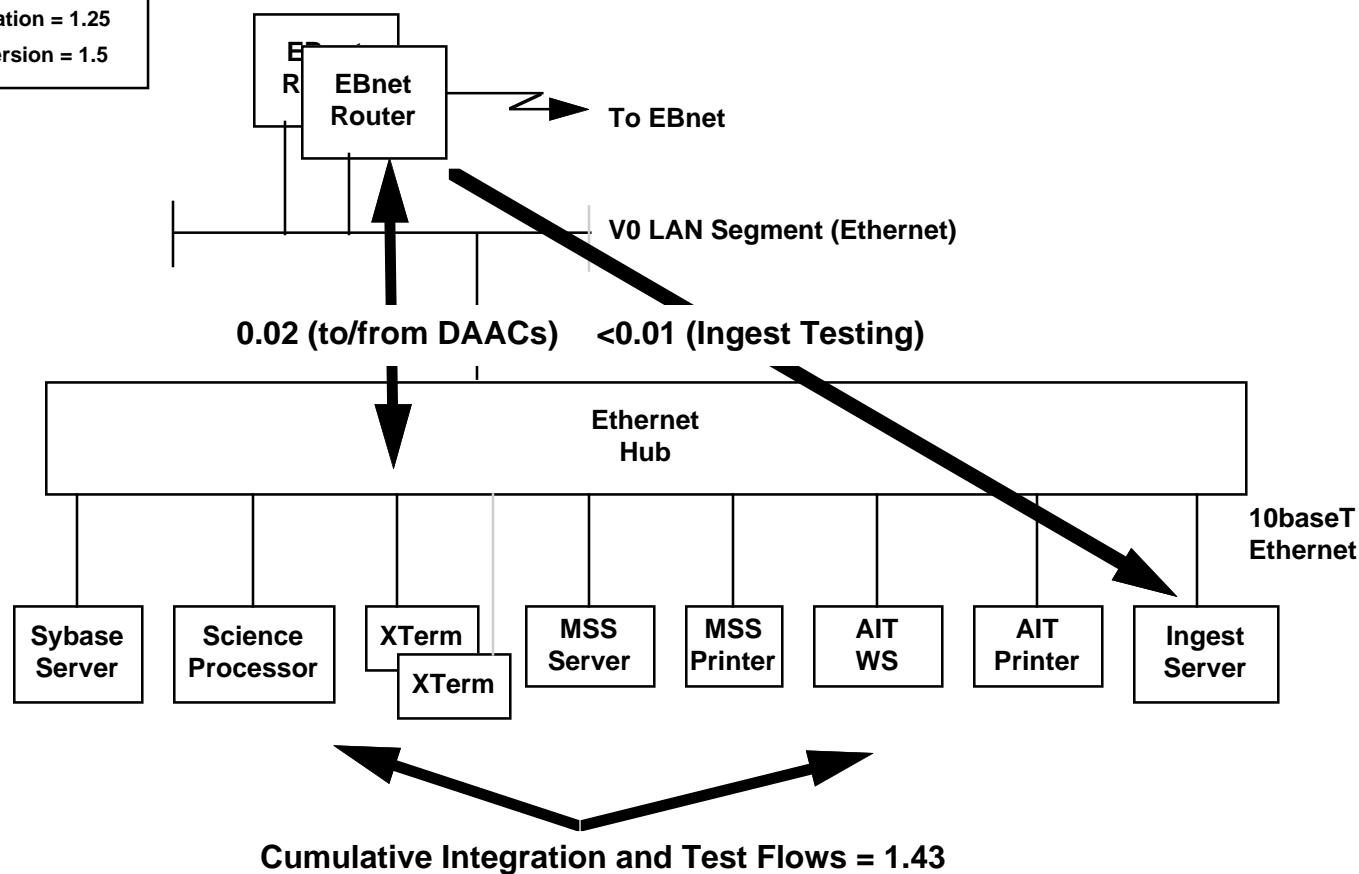


Overhead Factors

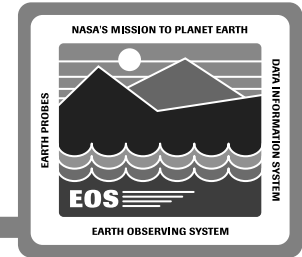
Protocol Overhead = 1.25

Ethernet Utilization = 1.25

Avg.-to-Peak Conversion = 1.5



Design Advantages



- **100 Mbps FDDI LANs provide plenty of capacity for Release A bandwidth needs**
- **Multiple FDDI LANs localize intra-subsystem traffic**
- **FDDI's inherent redundancy improves RMA**
- **FDDI switch/router provides network filtering to insure security to critical subsystems (such as Ingest)**
- **Scalable design allows additional rings to be created and additional hosts to be added without difficulty**

Migration Strategy for Release B and Beyond



Large increase in data flows during Release B

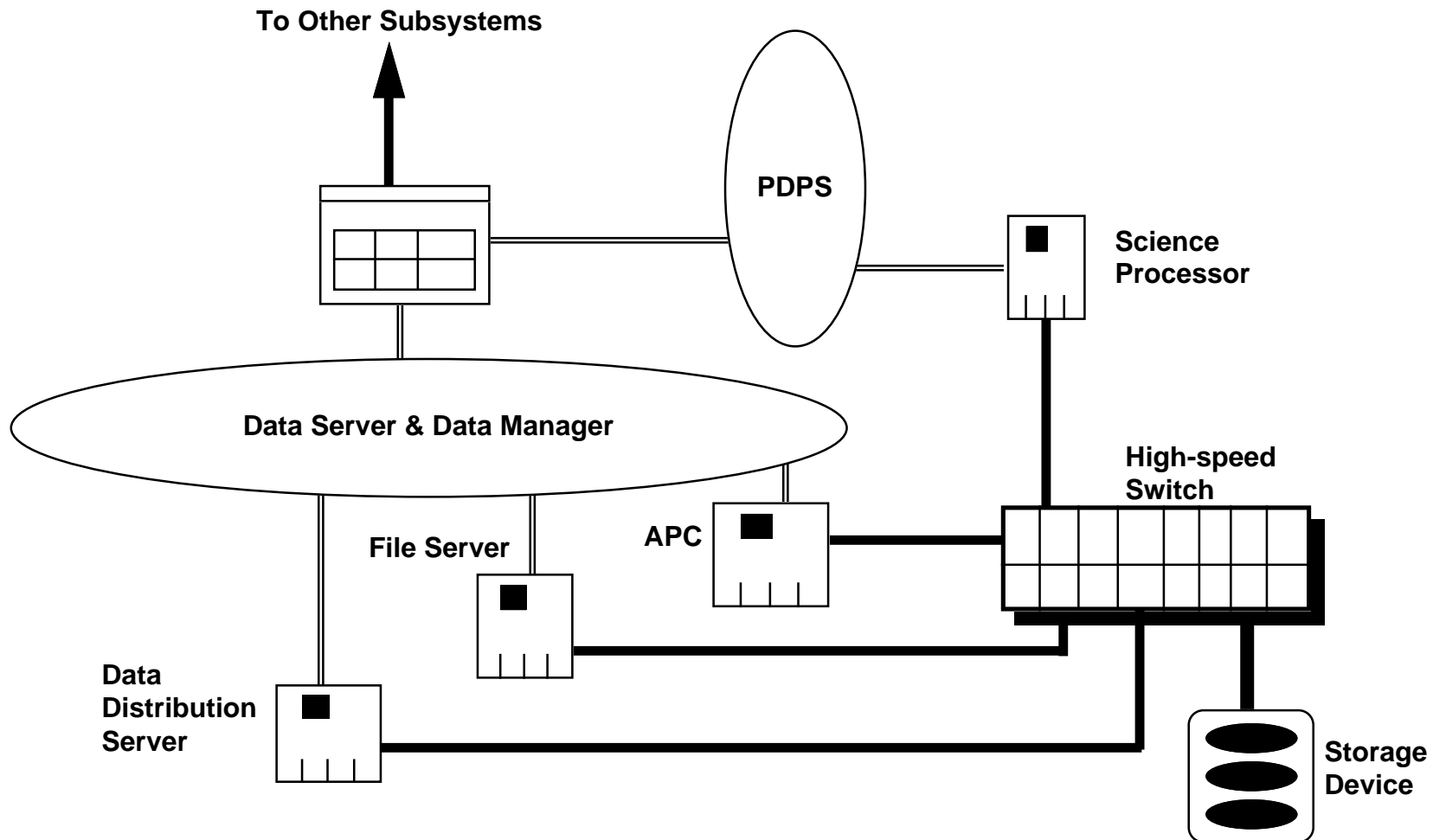
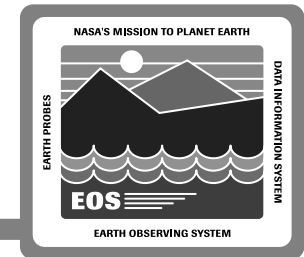
Other high-speed technologies being considered and prototyped

- **ATM (155 and 622 Mbps)**
- **HiPPI (800 Mbps)**

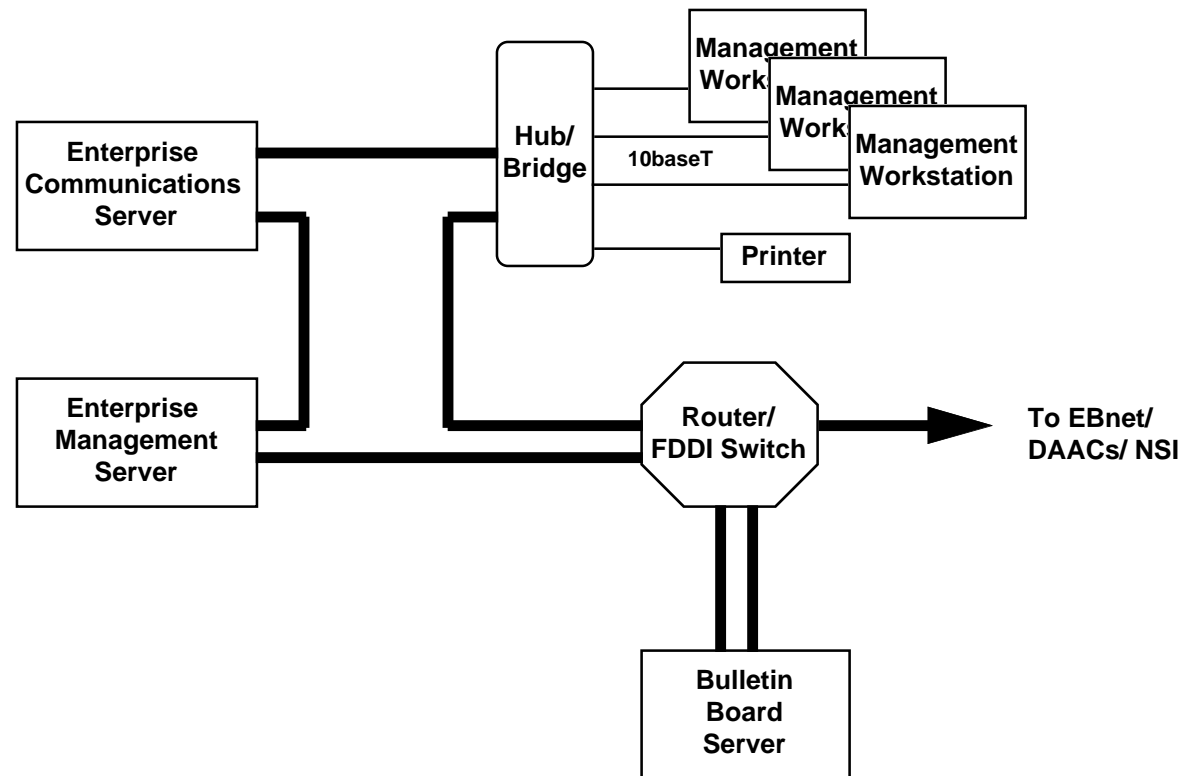
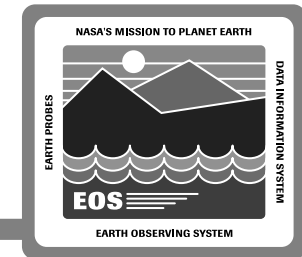
Architecture migration

- **Provide high-speed “parallel” network to handle production flows**
- **Separate interfaces for DAAC-DAAC flows (through EBnet) and user flows (through NSI)**
- **Allows production flows to be segregated from user flows**

Possible Network Topology for Release B



SMC Network Architecture



SMC Network Architecture



Consists of two FDDI rings

- **One for Communications and Management Servers and workstations**
- **Second for Bulletin Board Server**
 - **provides increased security by isolating BBS**
 - **keeps “general public” access to BBS from impacting other hosts**

FDDI implemented via physically wired rings

- **Eliminates concentrator hardware and increases availability (no single point of failure)**
- **Viable because host count very low**

Workstations on Ethernet

- **Connected to FDDI via Cabletron MicroMAC hub**